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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/519,142	09/27/2005	Henrik Jensen	55320.000401	3201
21967 7590 02/20/2009 HUNTON & WILLIAMS LLP INTELLECTUAL PROPERTY DEPARTMENT 1900 K STREET, N.W. SUITE 1200 WASHINGTON, DC 20006-1109				
EXAMINER				
SMITH, JENNIFER A				
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1793				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/519,142

**Applicant(s)**

JENSEN ET AL.

**Examiner**

JENNIFER A. SMITH

**Art Unit**

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 December 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 72-145 is/are pending in the application.
- 4a) Of the above claim(s) See Continuation Sheet is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,75,78-81,85,90-92,96-99,101-104,108-119,127-129 and 131 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 11/16/2005, 08/02/2006, 10/20/2006
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

Continuation of Disposition of Claims: Claims **withdrawn** from consideration are 72-74,76,77,82-84,86-89,93-95,100,105-107,120-126,130 and 132-145.

## **DETAILED ACTION**

### ***Status of Application***

Applicant's election with traverse to prosecute the invention of Group I (claims 1 and 75-136) in the reply filed on 05/29/2008 is acknowledged. The traversal is on the ground(s) that the claims share the special technical feature which the Applicant considers to be that the resulting product is obtained on a solid reactor material. This is not found persuasive because the special technical feature shared between the inventions is a metal oxide, metal oxidhydroxide or metal hydroxide product, which may be produced by a number of different processes. This product is disclosed in the Sarrade reference. The restriction requirement is still deemed proper and is therefore made FINAL.

Applicant has elected, in the reply filed on 12/22/2008, a species in **each** of the groups (a)-(h): Claims 78, 85, 90, 91-92, 96, 101-104, 117-119, 131.

Claims 72-74, 76-77, 82-84, 86-89, 93-95, 100, 105-107, 120-126, 130, and 132-145 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Claims 2-71 remain canceled.

Claims 1, 75, 78-81, 85, 90-92, 96-99, 101-104, 108-119, 127-129, and 131 are presented for examination.

***Information Disclosure Statements***

The information disclosure statements (IDS) submitted on 11/16/2005, 08/02/2006, and 10/20/2006 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements have been considered by the

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**Claims 1, 75, 78-81, 85, 90-92, 96-99, 101-104, 108-111, 116-119, 127-129, and 131 rejected under 35 U.S.C. 103(a) as being unpatentable over Sarrade et al. (US Patent No. 6,387,341) in view of Watkins et al. (Chem. Mater., 1995).**

In regard to claim 1, Sarrade et al. teach a method of making a metal oxide product from a charge of precursor(s) comprising one or more organo-metallic precursors, in contact with a reaction medium comprising supercritical CO<sub>2</sub> [See Claim 1]. The reaction medium may be supercritical CO<sub>2</sub> in the presence of a co-solvent, for example, water or ethanol [See Column 3, lines 50-53]. Sarrade et al. teach the manufacture of a powder composed of nanometric particles [See Column 1, lines 22-24].

Sarrade fails to teach a solid reactor filling material.

Watkins et al. teach a method of manufacturing nanosized metal clusters. A polymer substrate (solid reactor filling material) is present during the reaction [See Scheme 1] and the metal precursor (OM) is in contact with the polymer.

It would have been obvious to one of ordinary skill in the art, at the time of Applicant's invention, to include the additional polymer material like that taught in the Watkins reference in the reaction mechanism disclosed by Sarrade et al. because stabilization of the metal particles in a polymer matrix prevents agglomeration and facilitates fabrication into useful catalytic, optical, and electronic devices [See Watkins, Column 1].

In regard to claim 75, Sarrade et al. teach using the sol-gel route for the preparation of oxide powders [See Column 2, lines 26-29].

In regard to claim 78, Sarrade et al. teach the alkoxide precursors are, for example, tetra-ethoxy silane, titanium (IV) iso-propoxide, aluminum iso-propoxide, magnesium ethoxide or a *mixture* of these alkoxides [See Column 3, lines 31-33].

In regard to claims 79-81 and 96, Sarrade et al. teach the operating conditions, for example the choice of co-solvent, the mode of pressure reduction, the level of sampling and the contact time permits one to direct the texture of the desired final product. One of skill in the art would recognize the order of introduction of the materials into the reactor and mode of reactor operation are result-effective variables that can be varied and optimized within prior art conditions to produce a product with the desired texture [See Column 6, lines 57-60]. One would have been motivated to optimize these parameters to obtain a product useful in a specific application. This method, depending on the operating conditions (such as temperature, pressure, reactor residence time and flow rates, or reactions rates) leads to products in the form of liquids, gels, powders, fibers etc being obtained. The particle size and particle geometry is controllable as a function of the operating conditions used for its manufacture and the method of separation of the product obtained. Furthermore, the method of the invention permits the manufacture of a powder composed of nanometric particles. These powders find

application, for example, in the manufacture of ceramic materials, this manufacture requiring specially developed raw materials [See Column 1, lines 15-27]

In regard to claims 85 and 92, Sarrade et al. teach a fixed reaction temperature of between 31 and 100°C [See Claim 1].

In regard to claims 90 and 91, Sarrade et al. teach operation at a fixed pressure of  $10^7$  to  $5 \times 10^7$  Pa (100-500 bar) [See Claim 1]. The separation of the product based on the oxide formed, from the reaction medium, can be carried out by reducing the pressure of the supercritical CO<sub>2</sub>, to a pressure lower than the supercritical pressure of the CO<sub>2</sub> and at a constant temperature [See Column 4, lines 34-38]. The Sarrade reference teaches the pressure conditions to be result-effective variables in respect to the product formed. The supercritical pressure reduction can also be carried out in several pressure reduction stages that allow one to obtain different fractions of the product formed, which differ from one another by the size and/or the structure of the particles which make up this product [See Column 4, lines 41-46].

In regard to claims 97-99, Sarrade et al. teach the precursor charge is brought into contact with the supercritical CO<sub>2</sub> under pressure in the reaction vessel, for a contact time fixed at from 0 to 72 hours, with or without the presence of a co-solvent [See Column 9, lines 4-6]. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re



Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). See MPEP 2144.05 I.

In regard to claims 101-104, Sarrade et al. teach the alkoxide precursors are, for example, tetra-ethoxy silane, titanium (IV) iso-propoxide, aluminum iso-propoxide, magnesium ethoxide or a mixture of these alkoxides [See Column 3, lines 31-33].

In regard to claims 108 and 109, the reaction medium may be supercritical CO<sub>2</sub> in the presence of a co-solvent, for example, water or ethanol [See Column 3, lines 50-53].

In regard to claim 11, 111, 127, and 128, the Watkins reference teaches using a platinum precursor that is autocatalytic which is exploited to nucleate and grow platinum cluster [See Page 1992, Column 2]. One of skill in the art would have been motivated to provide a promoter, in addition, to increase the rate of reaction, and obtain more product. Here, the auto-catalytic platinum material is the metal containing material acts as the precursor and the reactor filler/seed material.

In regard to claims 116 and 129, Watkins et al. teach the polymer material acts as a collecting agent [See Scheme 1] and interacts with the metal containing precursor (OM)

In regard to claims 117-119, Watkins et al. teach a polymer material – poly(4-methyl-a-pentene) (PMP) or poly(tetrafluoroethylene) (PTFE) [See Page 1991, Column 2].

In regard to claim 131, Watkins et al. teaches the metal products are easily removable from the composites [See Page 1992, Column 2].

**Claims 112-115 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sarrade et al. (US Patent No. 6,387,341) in view of Watkins et al. (Chem. Mater., 1995) and further in view of Gao et al. (US Patent No. 6,291,719 B1)**

In regard to claims 112-115, the Watkins reference does not explicitly disclose the shape of the polymer reactor filling material.

Gao et al. teaches a reaction material which has a useful packing structure. Shapes include a window-lattice shape, star shape, etc. [See Claim 1].

One of skill in the art would recognize the shape and geometrical structure of the reactor filling material to be a result-effective variable and the size, shape, or structure of the metal oxide particles can be controlled by varying the type of polymer substrate like those taught by Watkins et al. The dual functional material developed by Gao et al.

has a large external surface area and high activity in the reaction due to its shape [See Column 5, lines 26-30]

### ***Conclusion***

Claims 1, 75, 78-81, 85, 90-92, 96-99, 101-104, 108-119, 127-129, and 131 are rejected.

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER A. SMITH whose telephone number is (571)270-3599. The examiner can normally be reached on Monday - Friday, 9:30am to 6:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571)272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J.A. LORENZO/  
Supervisory Patent Examiner, Art Unit 1793

Jennifer A. Smith  
February 11, 2009  
Art Unit 1793

JS